with small chrystals of the above calcareous matter, and the nodules agreeing very nearly in colour with the bed of clay in or near which they are found. These nodules, on being burnt with a heat stronger than that used for burning lime, generally assume a brown appearance, and are a little softened; and when so burnt and softened become warm (but do not slack) by having water thrown upon them, and on being reduced to powder, after burning and being mixed with water, just sufficient to make into a paste, become indurated in water in the space of an hour, or thereabouts. Any argillaceous stone, then corresponding with this description, whether known by the name of nodules of clay, or any other name, is the sort and kind only that I mean to apropriate to my own use in the formation of my cement. The manner in which I prepare and compose this cement is as follows; *viz.* The stones of clay, or nodules of clay, are first broken into small fragments; then burnt in a kiln or furnace, (as lime is commonly burnt,) with a heat nearly sufficient to vitrify them; then reduced to a powder by any mechanical or other operation, and the powder so obtained is the basis of the cement. To compose the cement in the best and most advantegeous manner, I take two measures of water and five measures of the powder thus described; then I add the powder to the water or the water to the powder, taking care to stir and beat them during the whole time of intermixture. The cement is then made, and will set, or will become indurated in ten or twenty minutes after the operation has ceased, either in or out of water. But although have described what I think the best proportions for the composition of the cement, it is expressly to be understood that these, and all other proportions, are to be included within the meaning and purpose of this specification, but that no other proportion will produce so strong a cement in so short a time as those I have here pointed out. And also that I occasionally burn and grind and mix the powder before described with lime and other stones, clay, sand, or calcined earths, in such proportions as may be necessary and useful for the purposes for which the cement is intended to be applied, always observing that the less water is used the better, and the sooner the mortar or cement is used after being made, the stronger and the more durable it will be.

A detail of experiments to ascertain the daily quantity of brown Muscovado Sugar necessary to fatten Sheep; to show its effects and value when so applied; and to demonstrate what substance or substances, sufficiently cheap, might be mixed with it, so as to prevent its application to common uses, and yet render it not unpalatable nor pernicious to animals which feed upon it. Submitted to the board of Agriculture, by the Rev. Dr. Cartwright.

On this ground, therefore, it is presumed that the following conclusions, drawn from the facts which I have now the honour to lay before the board, may be justified.

First. That sugar may be given with great advantage to sheep, if not confined; especially if they have access to green food, however little that green food may be in quantity.

Secondly. That sugar may be given to them with every prospect of a beneficial effect, in the quantity of four ounces *per* day to each sheep.

Thirdly. That sugar, supposing it to be purchased at four pence *per* pound, (which it might be if duty

free,) would at the rate of four ounces *per* day, be paid for in a return of flesh, exclusive of the advantage of expeditious feeding, and the benefit to be derived from the manure.

Fourthly. That six ounces *per* day to each sheep exceeds the maximum that can be given with the best advantage: (this, it is obvious, applies to the middle-sized sheep only, such as those on which I tried the experiment. It is probable that six ounces might not be too much for some of the larger breed of sheep, as four ounces might be too much for some of the dimunitive breeds).

Fifthly. That the advantage of stall-feeding sheep altogether upon sugar and dry food, of whatever nature that food may be, is extremely problematical.

Thus have I candidly laid before the board the result of a long series of experiments which, it will be perceived, have been prosecuted with unremitted attention and, in consequence of my being particularly circumstanced, at no inconsiderable expense and trouble for the space of four months and upwards.

Should any gentleman be disposed to repeat these experiments, having within himself all the requisite conveniences for such an undertaking I cannot but persuade myself, though he will certainly attain his object more cheaply and readily than I have done, that his conclusions will confirm the general accuracy of mine.

Observations on Luminous Animals; by J Macartney, esq.

(Concluded from page 325.)

I shall terminate this paper by an enumeration of the several conclusions, that are the result of the observations I have been able to make upon the phenomena of animal light.

The property of emitting light, is confined to animals of the simplest organization, the greater number of which are inhabitants of the sea. The luminous property is not constant, but in general, exists only at certain periods, and in particular states of the animal's body. The power of shewing light, resides in a peculiar substance or fluid, which is sometimes situated in a particular organ, and at others diffused throughout the animal's body. The light is differently regulated, when the luminous matter exists in the living body, and when it is extracted from it. In the first case, it is intermitting, or alternated with periods of darkness; is commonly produced or increased by a muscular effort; and is sometimes absolutely dependant upon the will of the animal. In the second case, the luminous appearance is usually permanent, until it becomes extinct, after which it may be restored directly by friction, concussion, and the application of warmth; which last causes operate on the luminous matter (while in the living body), only indirectly, by exciting the animal. The luminous matter, in all situations, so far from possessing phosphoric properties, is incombustible, and loses the quality of emitting light, by being dried, or much heated. The exhibition of light, however long it may be continued, causes no diminution of the bulk of the luminous matter. It does not require the presence of pure air, and is not extinguished by other gasses.

The luminous appearance of living animals is not exhausted by long continuance, or frequent repetions, nor accumulated by exposure to natural light; it is, therefore, not dependent upon any foreign source, but inheres as a property, in a peculiarly organised animal, substance, or fluid, and is regulated by the same laws which govern all the other functions of living beings.